## Follow-Up of Ten Neonatal ECMO Survivors

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Extracorporeal membrane oxygenation (ECMO) can support newborns with respiratory failure who are responding poorly to maximum conventional ventilatory treatment (1-3). Presently neonates are selected for ECMO only if their morbidity/mortality risk is very high (3,4). Neonatal ECMO survivors are followed both for possible complications from being very ill prior to ECMO and from ECMO itself.

During ECMO blood is drained from a cannula in the right atrium, oxygenated by a membrane lung, and pumped back to the patient. Blood is returned to the right common carotid artery in veno-arterial (VA) ECMO, and to the femoral vein in venovenous (VV) ECMO.

From June 1981 through September 1982, ten neonates with birth weights over 2.5 kg were selected for ECMO because of refractory persistent fetal circulation (PFC). Two had primary PFC, and the others had secondary PFC. Each was responding poorly despite hyperventilation, pharmacologic paralysis, and vasoactive drugs. The mean age starting ECMO was 90 hours (24-178 hours), and the mean time on ECMO was 75 hours (34-113 hours). Three patients were on VA ECMO alone, five were on VV alone, and two were switched from VV to VA.

All ten survived with ECMO. Mean number of days in the initial hospitalization was 38 days (18-67 days). One patient was resuscitated from a near-miss sudden infant death prior to discharge.

Three patients (two VV, one VV-to-VA) have a poor outcome. The two VV patients have cerebral palsy, one also having microcephaly. The third infant, who was the oldest prior to going on ECMO, has bronchopulmonary dysplasia, required oxygen for 11 months, and has failure to thrive. Two of these three have been rehospitalized four times. All three score less than 80 on both the mental and motor parts of the Bayley Scales of Infant Development.

Two patients (one VV, one VV-to-VA) have a questionable outcome. Both have a small head circumference and have had moderately abnormal EEGs, but both have normal developmental milestones and normal Bayley scores (mental scores 108 and 112, motor scores 97 and 103).

Five patients (three VA, two VV) have a good outcome, with normal growth and development. Their mean Bayley mental score is 107 (86-139) and mean Bayley motor score is 97 (82-105). Follow-up EEGs have ranged from normal to moderately abnormal.

At follow-up, none of the patients have problems that can be directly attributed to ECMO. Patients with ligation of the right common carotid (VA ECMO) have no short-term sequelae from this procedure. Patients with femoral vein ligation (VV ECMO) have mild swelling of the ipsilateral leg.

## References

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